

CLAIMS

1 1. A multiple beam generator for use in a scanning system, said generator comprising:
2 an acousto-optic deflector (AOD) which during use receives a laser beam and generates a
3 deflected beam, the deflection of which is determined by an AOD control signal;
4 a diffractive element which generates an array of input beams from the deflected beam;
5 and
6 a control circuit which during operation generates the AOD control signal and varies a
7 characteristic of the first control signal to account for errors in the scanning system.

1 2. The generator of claim 1 wherein the control circuit receives a feedback signal that is
2 a measure of a deflection error of an output beam array from a desired position, said output beam
3 array derived from said input beam array and wherein the control circuit generates the AOD
4 control signal to reduce the deflection error.

1 3. The generator of claim 1 further comprising an acousto-optic modulator (AOM) which
2 receives the array of beams a separately modulates each of the received beams in accordance
3 with a second control signal to produce an output beam array.

1 4. The generator of claim 3 wherein the control circuit includes a table of corrections
2 which the control circuit uses to generate the AOD control signal.

1 5. The generator of claim 4 wherein said table stores corrections for stripe position errors
2 associated with the scanning system.

1 6. The generator of claim 5 wherein said table stores corrections for variation in beam
2 velocity over a scan line within the scanning system.

1 7. The generator of claim 5 wherein said table stores corrections for facet-by-facet
2 position error attributable to a polygon mirror in the scanning system.

1 8. The generator of claim 4 wherein said table stores corrections for intensity errors
2 associated with the scanning system.

1 9. The generator of claim 8 wherein said table stores corrections for scan-line intensity
2 variations within the scanning system.

1 10. The generator of claim 8 wherein said table stores corrections for intensity variation
2 from stripe deflection across a sound field within the AOM.

1 11. The generator of claim 8 wherein said table stores corrections for intensity variation
2 due to reflectivity variations within a polygonal scanning element that is part of the scanning
3 system.

1 12. A beam deflection control system comprising:
2 a generator that during operation generates a first array of beams;
3 a scanning element that during operation receives a second array of beams derived from
4 the first array of beams and scans the second array of beams over a scan region;
5 a deflection measurement circuit including a chevron pattern detector across which one of
6 the beams of the scanned array of beams scans during operation, said chevron pattern detector
7 generating a signal that is a measure of the location of the scanned array of beams in a direction
8 transverse to the scan direction, said chevron pattern detector including an angled slit across
9 which said one of the beams passes; and
10 a control circuit which during operation receives a feedback signal from the deflection
11 measurement circuit that is a measure of a deflection error between the output beam array and a
12 desired position, wherein the control circuit generates the first control signal to reduce the
13 deflection error.

1 13. The system of claim 12 wherein said generator comprises:
2 an acousto-optic deflector which during use receives a laser beam and generates a
3 deflected beam, the deflection of which is determined by a first control signal; and
4 a diffractive element which generates the first array of beams from the deflected beam.

1 14. The system of claim 12 wherein the chevron pattern detector also includes a vertical
2 slit across which the said one of the beams passes.

1 15. The system of claim 12 wherein the chevron pattern detector also includes a vertical
2 slit and a plurality of angled slits across which the said one of the beams passes, said first-
3 mentioned angled slit being one of said plurality of angled slits.

1 16. The system of claim 12 wherein the chevron pattern detector also includes a vertical
2 slit, a first plurality of angled slits and a second plurality of angled slits symmetrically oriented
3 with respect to the first plurality of slits, wherein the said one of the beams passes over the
4 vertical slit and the first and second plurality of slits and wherein said first-mentioned angled slit
5 is one of said first plurality of angled slits.

1 17. The system of claim 12 wherein the chevron pattern detector is characterized by a
2 path along which the said one of the beams passes during operation and wherein the chevron
3 pattern detector further includes a detector region along said path for determining whether the
4 beam is properly aligned over said path.

1 18. A method of measuring deflection of scanned beams, said method comprising:
2 scanning a selected beam of an array of beams over a first zone and scanning multiple
3 beams of said array of beams over a second zone;
4 while scanning over the first zone, passing the selected beam over a chevron pattern
5 detector to generate a detection signal; and
6 using the detection signal to determine a position of the selected beam in a direction that
7 is transverse to the scanning direction.

1 19. The method of claim 18 wherein the detection signal is a timing signal and using the
2 detection signal involves measuring a duration of the timing signal to determine the position of
3 the selected beam.

1 20. The method of claim 18 wherein the chevron pattern detector also includes a vertical
2 slit and an angled slit and wherein the scanning involves passing the selected beam over the
3 vertical slit and the angled slit, said vertical slit being oriented orthogonal to the direction of
4 movement of the selected beam and the angled slit being oriented at a non-orthogonal angle
5 relative to the direction of movement of the selected beam.

1 21. The method of claim 18 wherein the chevron pattern detector also includes a vertical
2 slit and a plurality of angled slits and wherein the scanning involves passing the selected beam
3 over the vertical slit and the plurality of angled slits, said vertical slit being oriented orthogonal
4 to the direction of movement of the selected beam and the plurality of angled slits being oriented
5 at a non-orthogonal angle relative to the direction of movement of the selected beam.

1 22. The method of claim 18 wherein the chevron pattern detector also includes a vertical
2 slit, a first plurality of angled slits and a second plurality of angled slits, wherein the scanning
3 involves passing the selected beam over the vertical slit and the first and second plurality of
4 angled slits, said vertical slit being oriented orthogonal to the direction of movement of the
5 selected beam and the first plurality of angled slits being oriented at a non-orthogonal angle
6 relative to the direction of movement of the selected beam and the second plurality of angled slits
7 is symmetrically oriented with respect to the first plurality of angled slits.

1 23. The method of claim 18 wherein the chevron pattern detector is characterized by a
2 path over which the selected beam passes during operation and wherein the chevron pattern
3 detector further includes a detector region along said path for determining whether the selected
4 beam is properly aligned to pass over said path, said method further comprising detecting
5 whether the selected beam is passing over the detector region.

1